BASCD 2024 Abstract #20

A modelling methodology exploring the effect of distance patients travel to NHS services

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Background:

The proximity of where patients live to dental services affects service utilisation therefore it is important to determine how far patients live from care providers. For dental services in England, the Business Services Authority (BSA) usually provide aggregated population data reported as Middle Super Output Areas (MSOAs) to preserve anonymity, and using this non-identifiable data poses a challenge. As an example, it would be of value to investigate child sedation rates, given these are significantly higher in parts of the North East than other areas of the UK. This project therefore aimed to use this method to investigate this discrepancy.

Objectives:

To determine the distance children travel to NHS sedation services and explore the relationship between proximity and sedation rate using publicly available datasets and non-identifiable patient data from the BSA.

Methods:

Sedation rates were determined for each MSOA across Local Authorities in the North East by aggregating three years of data from the BSA. Each MSOA has a Population Weighted Centroid (PWC), produced by the Office for National Statistics. The latitude and longitude of the PWC and the postcode of the closest sedation provider were determined, and the distance between them calculated using the haversine formula. The effect of proximity to service providers was explored using correlation and regression techniques.

Results:

Sedation rates varied across the North East, with some of the highest sedation rates observed in Middlesbrough and Stockton-on-Tees. The proximity of the sedation service to populations had a significant effect on the sedation rate ($p<0.001$), especially in local authorities with high sedation rates.

Conclusion:

This is an effective and time efficient method to determine the distance patients travel to NHS dental services using non-identifiable patient information and publicly available datasets. This model can also be applied to other dental services where distance may influence service utilisation.

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